

Monitoring Laboratory Performance Evaluation Sample Usage and Results

Presented By

Keith Strout, Clyde Hedin, and Timothy Vonnahme
Quality Assurance Technical Support (QATS) Program
CB&I Federal Services LLC

and

Shari Myer, US EPA Analytical Services Branch

March 31 - April 1, 2015



- CLP Field Sample and PES Analysis Summary Report
- PES Results Summary Reports
- EPA Regional PES Results Monitoring
- What's up with Antimony in Soil Samples?
- SPSWeb Changes
- PES Information

CLP Field Sample and PES Analysis Summary

- QATS recently evaluated and reported the number of field samples versus PESs analyzed through the CLP for 2 time periods; April 1, 2012 – March 31, 2013 (Period 1), and April 1, 2013 – March 31, 2014 (Period 2).
- Sample usage was evaluated by fraction and matrix, and categorized by EPA Region and CLP laboratory.
- All CLP labs, both SOM and ISM, analyze QB samples 4 times per year, which includes each analytical fraction and matrix.
- Regions 1, 4, and 7 were the only Regions that routinely used PESs associated with CLP sample analysis during both periods.
- Region 9 used a substantial number of special-request PESs, but typically not through the CLP.



CLP Inorganic Field Sample and PES Analysis Data by Region April 1, 2012 through March 31, 2013										
CLP Inorganic Field Sample SDGs Processed										
Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Total
81	254	305	138	136	116	269	183	111	499	2,092
CLP Inorganic Field Sample Analyses										
Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Total
2,830	5,231	6,314	2,939	3,070	3,833	4,431	4,160	2,691	10,548	46,047
CLP Inorganic PES Analyses										
Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Total
131	0	0	193	0	0	73	0	0	0	397
CLP Inorganic Field Sample to PES Analysis Ratio										
Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Total
22:1	NA	NA	15:1	NA	NA	61:1	NA	NA	NA	116:1

CLP Inorganic Field Sample and PES Analysis Data by Region April 1, 2013 through March 31, 2014										
CLP Inorganic Field Sample SDGs Processed										
Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Total
52	204	202	47	103	45	248	100	243	467	1,711
CLP Inorganic Field Sample Analyses										
Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Total
1,208	3,026	3,583	956	3,236	1,620	4,269	1,896	4,916	9,976	34,686
CLP Inorganic PES Analyses										
Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Total
64	0	0	60	0	0	79	0	2	0	205
CLP Inorganic Field Sample to PES Analysis Ratio										
Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Total
19:1	NA	NA	16:1	NA	NA	54:1	NA	NA	NA	169:1

CLP Organic Field Sample and PES Analysis Data by Region April 1, 2012 through March 31, 2013										
CLP Organic Field Sample SDGs Processed										
Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Total
86	332	433	256	181	216	114	106	138	79	1,941
CLP Organic Field Sample Analyses										
Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Total
2,465	7,143	7,635	6,288	4,085	6,208	1,835	1,582	3,165	1,178	41,584
CLP Organic PES Analyses										
Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Total
161	0	0	299	0	0	49	0	0	0	509
CLP Organic Field Sample to PES Analysis Ratio										
Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Total
15:1	NA	NA	21:1	NA	NA	37:1	NA	NA	NA	82:1

CLP Organic Field Sample and PES Analysis Data by Region April 1, 2013 through March 31, 2014										
CLP Organic Field Sample SDGs Processed										
Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Total
45	294	343	114	156	77	104	73	156	28	1,390
CLP Organic Field Sample Analyses										
Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Total
1,204	6,351	6,392	2,354	4,072	1,843	1,544	1,094	4,033	733	29,620
CLP Organic PES Analyses										
Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Total
99	0	0	113	0	0	43	0	1	0	256
CLP Organic Field Sample to PES Analysis Ratio										
Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Total
12:1	NA	NA	21:1	NA	NA	36:1	NA	NA	NA	116:1

CLP Inorganic Field Sample and PES Analysis Data by Regional Percentage										
Percentage of Total CLP Inorganic Field Samples Analyzed by Region – April 1, 2012 through March 31, 2013										
Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Total
6.1%	11.4%	13.7%	6.4%	6.7%	8.3%	9.6%	9.0%	5.8%	22.9%	100%
Percentage of Total CLP Inorganic PESs Analyzed by Region – April 1, 2012 through March 31, 2013										
Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Total
33.0%	0.0%	0.0%	48.6%	0.0%	0.0%	18.4%	0.0%	0.0%	0.0%	100%
Percentage of Total CLP Inorganic Field Samples Analyzed by Region – April 1, 2013 through March 31, 2014										
Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Total
3.5%	8.7%	10.3%	2.8%	9.3%	4.7%	12.3%	5.5%	14.2%	28.8%	100%
Percentage of Total CLP Inorganic PESs Analyzed by Region – April 1, 2013 through March 31, 2014										
Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Total
31.2%	0.0%	0.0%	29.3%	0.0%	0.0%	38.5%	0.0%	1.0%	0.0%	100%

CLP Organic Field Sample and PES Analysis Data by Regional Percentage										
Percentage of Total CLP Organic Field Samples Analyzed by Region – April 1, 2012 through March 31, 2013										
Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Total
5.9%	17.2%	18.4%	15.1%	9.8%	14.9%	4.4%	3.8%	7.6%	2.8%	100%
Percentage of Total CLP Organic PESs Analyzed by Region – April 1, 2012 through March 31, 2013										
Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Total
31.6%	0.0%	0.0%	58.7%	0.0%	0.0%	9.6%	0.0%	0.0%	0.0%	100%
Percentage of Total CLP Organic Field Samples Analyzed by Region – April 1, 2013 through March 31, 2014										
Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Total
4.1%	21.4%	21.6%	7.9%	13.7%	6.2%	5.2%	3.7%	13.6%	2.5%	100%
Percentage of Total CLP Organic PESs Analyzed by Region – April 1, 2013 through March 31, 2014										
Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Total
38.7%	0.0%	0.0%	44.1%	0.0%	0.0%	16.8%	0.0%	0.4%	0.0%	100%

Monitoring Laboratory PES Usage and Results

CLP Inorganic Field Sample and PES Analysis Data by Laboratory April 1, 2012 through March 31, 2013							
CLP Inorganic Field Sample SDGs Processed							
A4	BONNER	CHEM	DATAAC	MITKEM	STLV	TALGA	Total
574	418	381	365	255	130	38	2,161
CLP Inorganic Field Sample Analyses							
A4	BONNER	CHEM	DATAAC	MITKEM	STLV	TALGA	Total
11,171	6,962	9,756	8,266	6,754	2,937	632	46,478
CLP Inorganic PES Analyses							
A4	BONNER	CHEM	DATAAC	MITKEM	STLV	TALGA	Total
80	96	66	53	69	20	13	397
CLP Inorganic Field Sample to PES Analysis Ratio							
A4	BONNER	CHEM	DATAAC	MITKEM	STLV	TALGA	Total
140:1	73:1	148:1	156:1	98:1	147:1	49:1	117:1
Percentage of Total CLP Inorganic Field Samples Analyzed by Laboratory							
A4	BONNER	CHEM	DATAAC	MITKEM	STLV	TALGA	Total
24.0%	15.0%	21.0%	17.8%	14.5%	6.3%	1.4%	100%
Percentage of Total CLP Inorganic PESs Analyzed by Laboratory							
A4	BONNER	CHEM	DATAAC	MITKEM	STLV	TALGA	Total
20.2%	24.2%	16.6%	13.4%	17.4%	5.0%	3.3%	100%

CLP Inorganic Field Sample and PES Analysis Data by Laboratory April 1, 2013 through March 31, 2014							
CLP Inorganic Field Sample SDGs Processed							
A4	BONNER	CHEM	DATAAC	MITKEM	STLV	TALGA	Total
391	416	539	157	160	84	1	1,748
CLP Inorganic Field Sample Analyses							
A4	BONNER	CHEM	DATAAC	MITKEM	STLV	TALGA	Total
8,870	6,753	11,091	3,257	3,317	1,454	8	34,750
CLP Inorganic PES Analyses							
A4	BONNER	CHEM	DATAAC	MITKEM	STLV	TALGA	Total
26	56	96	18	8	1	0	205
CLP Inorganic Field Sample to PES Analysis Ratio							
A4	BONNER	CHEM	DATAAC	MITKEM	STLV	TALGA	Total
341:1	121:1	116:1	181:1	415:1	1,454:1	NA	170:1
Percentage of Total CLP Inorganic Field Samples Analyzed by Laboratory							
A4	BONNER	CHEM	DATAAC	MITKEM	STLV	TALGA	Total
25.5%	19.4%	31.9%	9.4%	9.5%	4.2%	0.0%	100%
Percentage of Total CLP Inorganic PESs Analyzed by Laboratory							
A4	BONNER	CHEM	DATAAC	MITKEM	STLV	TALGA	Total
12.7%	27.3%	46.8%	8.8%	3.9%	0.5%	0.0%	100%

Chart 1 - CLP Laboratory Inorganic Analysis Summary
April 1, 2012 through March 31, 2013

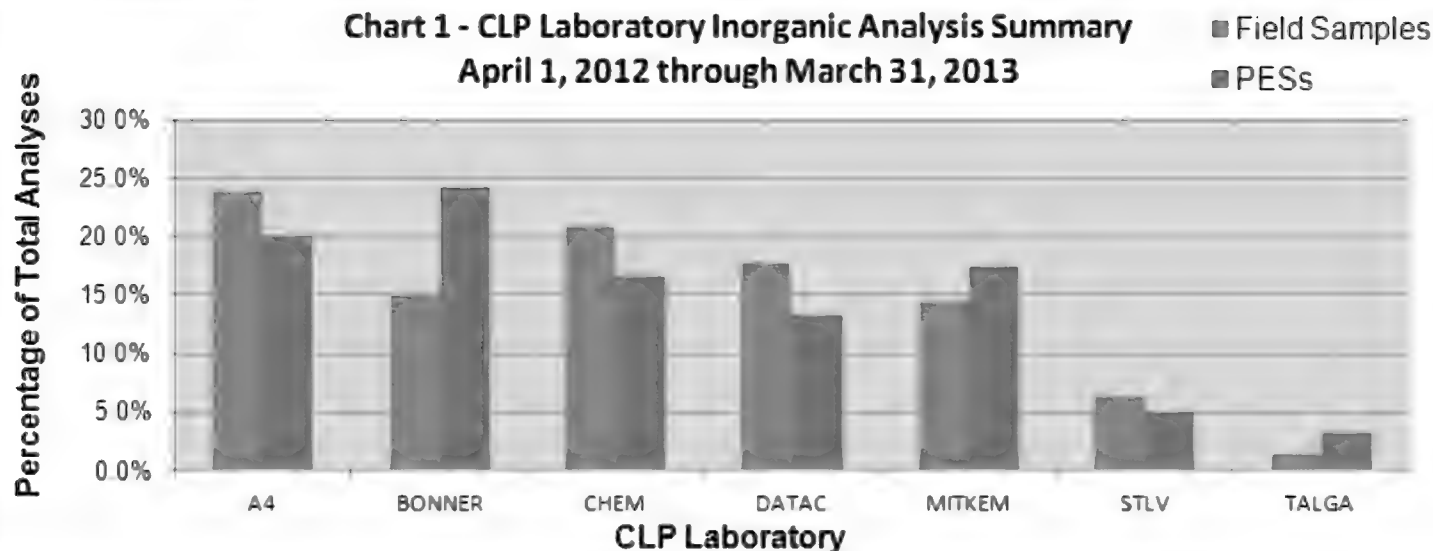
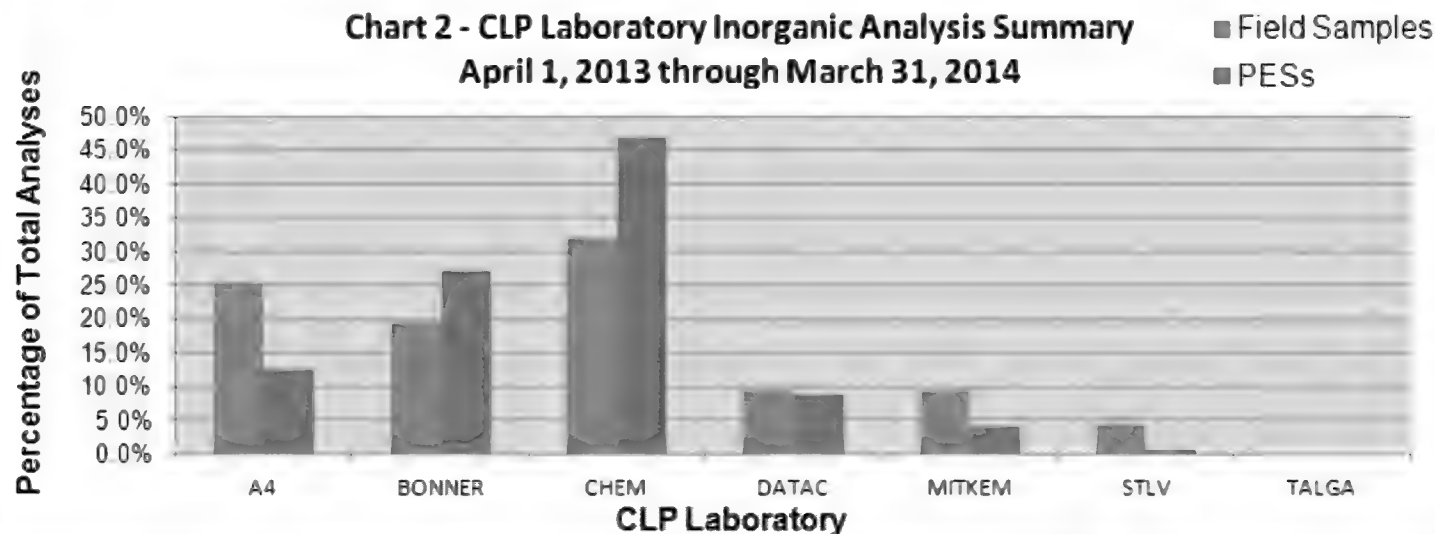


Chart 2 - CLP Laboratory Inorganic Analysis Summary
April 1, 2013 through March 31, 2014



Monitoring Laboratory PES Usage and Results

CLP Organic Field Sample and PES Analysis Data by Laboratory

April 1, 2012 through March 31, 2013

CLP Organic Field Sample SDGs Processed

A4	BONNER	CHEM	DATAAC	KAP	LIBRTY	MITKEM	PEL	SHEALY	STLV	Totals
400	29	115	371	486	128	201	173	59	49	2,011

CLP Organic Field Sample Analyses

A4	BONNER	CHEM	DATAAC	KAP	LIBRTY	MITKEM	PEL	SHEALY	STLV	Totals
7,943	97	2,223	9,004	9,472	3,040	4,984	2,948	992	1,163	41,866

CLP Organic PES Analyses

A4	BONNER	CHEM	DATAAC	KAP	LIBRTY	MITKEM	PEL	SHEALY	STLV	Totals
45	6	10	92	107	84	139	0	10	16	509

CLP Organic Field Sample to PES Analysis Ratio

A4	BONNER	CHEM	DATAAC	KAP	LIBRTY	MITKEM	PEL	SHEALY	STLV	Totals
177:1	16:1	222:1	98:1	89:1	36:1	36:1	NA	99:1	73:1	82:1

Percentage of Total CLP Organic Field Samples Analyzed by Laboratory

A4	BONNER	CHEM	DATAAC	KAP	LIBRTY	MITKEM	PEL	SHEALY	STLV	Totals
19.0%	0.2%	5.3%	21.5%	22.6%	7.3%	11.9%	7.0%	2.4%	2.8%	100%

Percentage of Total CLP Organic PESs Analyzed by Laboratory

A4	BONNER	CHEM	DATAAC	KAP	LIBRTY	MITKEM	PEL	SHEALY	STLV	Totals
8.8%	1.2%	2.0%	18.1%	21.0%	16.5%	27.3%	0.0%	2.0%	3.1%	100%

Monitoring Laboratory PES Usage and Results

CLP Organic Field Sample and PES Analysis Data by Laboratory

April 1, 2013 through March 31, 2014

CLP Organic Field Sample SDGs Processed

A4	CHEM	DATAAC	KAP	LIBRTY	MITKEM	PEL	SHEALY	STLV	Totals
75	171	135	454	67	303	87	117	24	1,433

CLP Organic Field Sample Analyses

A4	CHEM	DATAAC	KAP	LIBRTY	MITKEM	PEL	SHEALY	STLV	Totals
1,537	3,036	2,567	9,866	1,348	5,867	1,705	3,291	414	29,631

CLP Organic PES Analyses

A4	CHEM	DATAAC	KAP	LIBRTY	MITKEM	PEL	SHEALY	STLV	Totals
22	29	18	89	11	59	3	23	2	256

CLP Organic Field Sample to PES Analysis Ratio

A4	CHEM	DATAAC	KAP	LIBRTY	MITKEM	PEL	SHEALY	STLV	Totals
70:1	105:1	143:1	111:1	123:1	99:1	568:1	143:1	207:1	116:1

Percentage of Total CLP Organic Field Samples Analyzed by Laboratory

A4	CHEM	DATAAC	KAP	LIBRTY	MITKEM	PEL	SHEALY	STLV	Totals
5.2%	10.2%	8.7%	33.3%	4.5%	19.8%	5.8%	11.1%	1.4%	100%

Percentage of Total CLP Organic PESs Analyzed by Laboratory

A4	CHEM	DATAAC	KAP	LIBRTY	MITKEM	PEL	SHEALY	STLV	Totals
8.6%	11.3%	7.0%	34.8%	4.3%	23.0%	1.2%	9.0%	0.8%	100%

Chart 3 - CLP Laboratory Organic Analysis Summary
April 1, 2012 through March 31, 2013

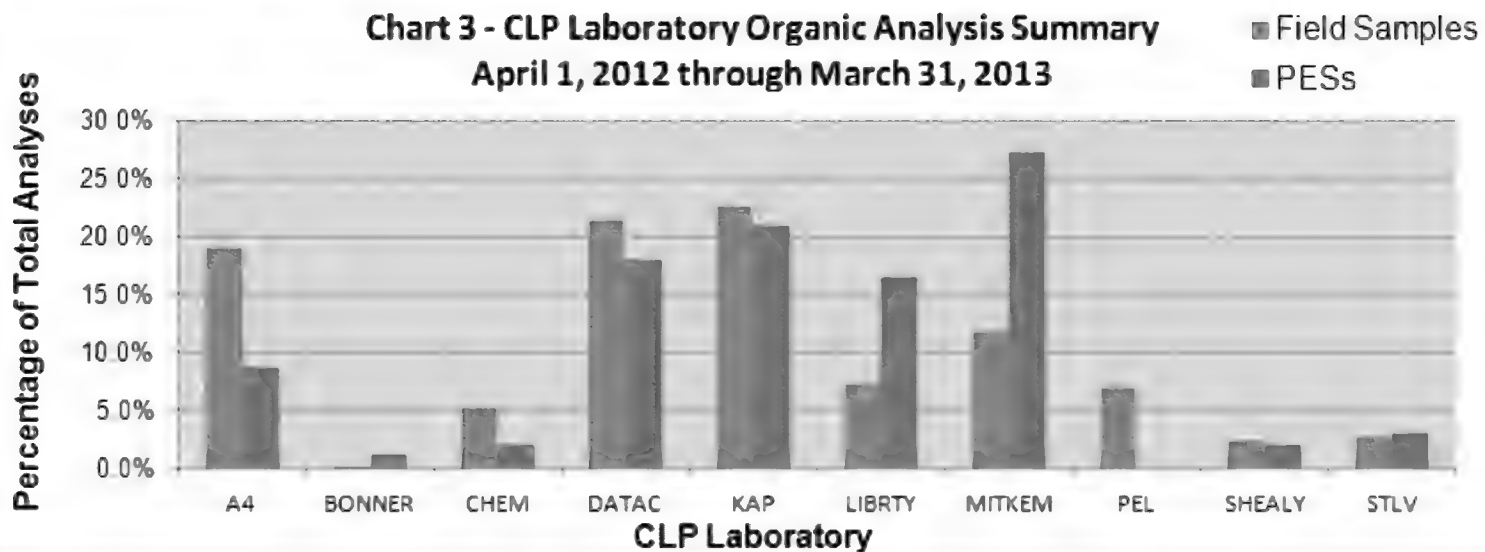
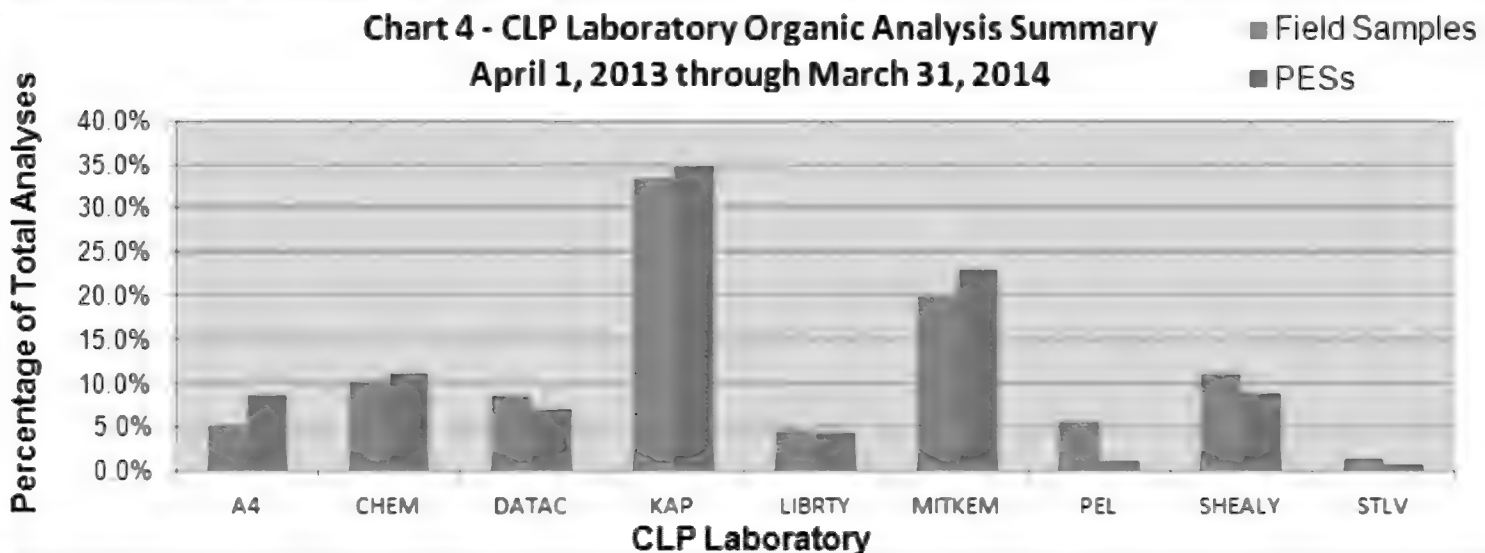


Chart 4 - CLP Laboratory Organic Analysis Summary
April 1, 2013 through March 31, 2014



PES Results Summary Reports

- SOM and ISM PES Results Summary Reports include all routine PES results and QB results for each CLP lab.
- Reports allow ASB to monitor lab PES performance program-wide.
- Reports evaluate all results over 2 distinct periods:
 - ✓ Entire term of the CLP contract (typically from September 1, 2010)
 - ✓ Most recent 6-month period (all reports updated every 6 months)
- Parameters evaluated include:
 - ✓ Number of PESs analyzed by fraction and matrix for both periods
 - ✓ PES requesting region
 - ✓ Date scored, number of analytes scored, reported results, performance compared to SPSWeb acceptance limits
 - ✓ QB performance
- Individual PES and QB lab results are compared to all CLP lab results (individual and composite), by fraction and matrix.

Table 1: Laboratory Code B SOM PESs Analyzed

Analytical Fraction	PESs Analyzed 09/01/2010 – 02/28/2015	PESs Analyzed 09/01/2014 – 02/28/2015
Trace Aqueous Volatile Organics	62	11
L/M Aqueous Volatile Organics	46	5
Volatile Organics in Soil	55	7
Aqueous Semivolatile Organics	51	5
Aqueous SIM Semivolatile Organics	30	5
Aqueous 1,4-Dioxane Extractable	6	0
Semivolatile Organics in Soil	73	8
SIM Semivolatile Organics in Soil	17	2
Aqueous Pesticides	21	1
Pesticides in Soil	32	5
Aqueous Aroclors	17	1
Aroclors in Soil	74	9

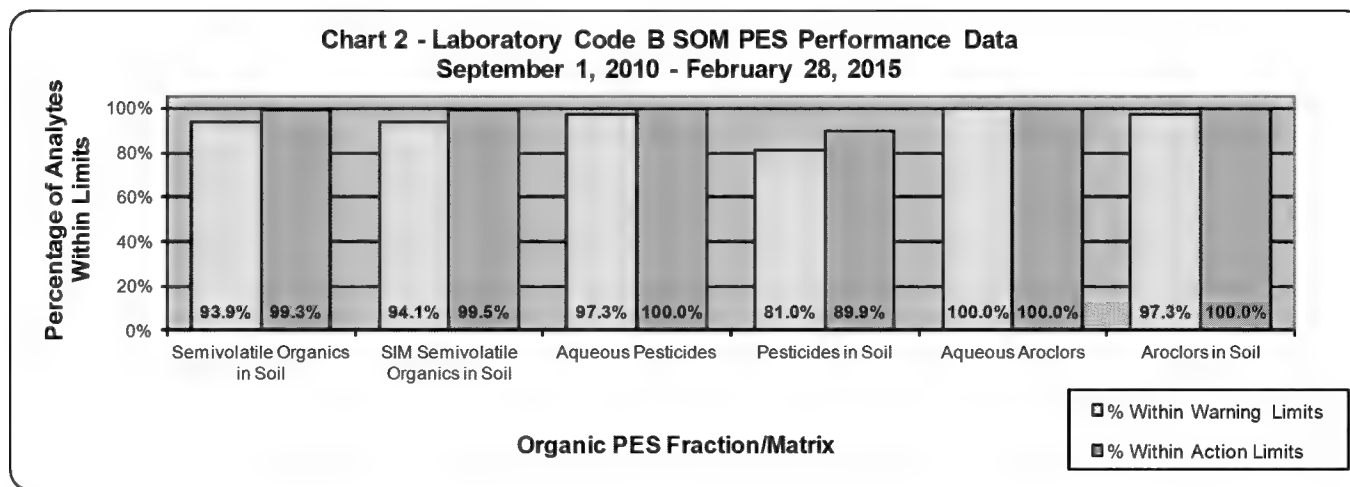
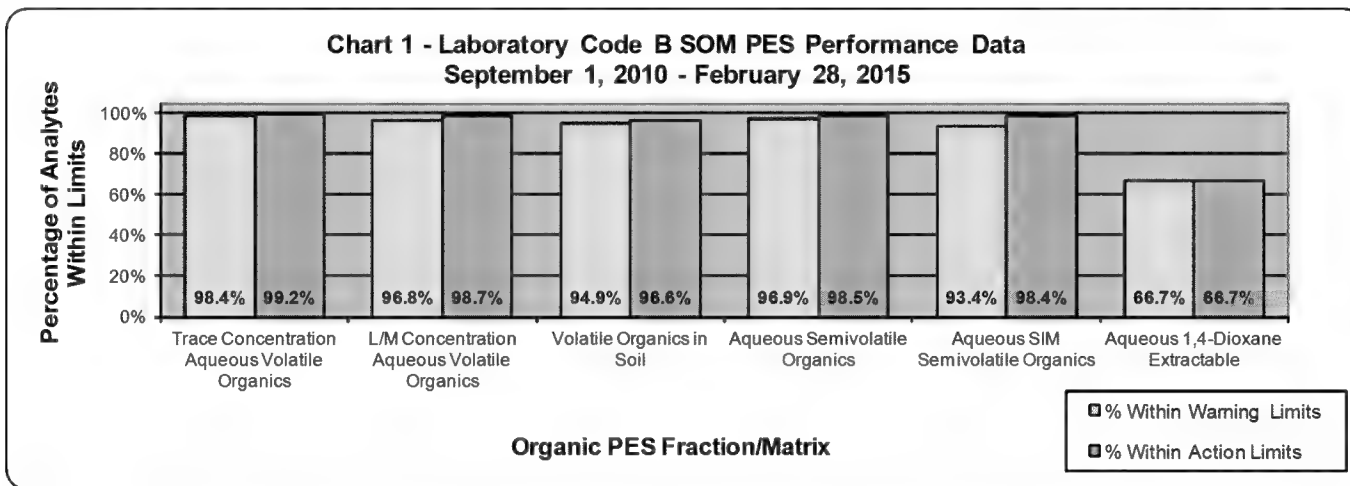
Table 2: Laboratory Code B SOM PES Performance Summary (09/01/2010 – 02/28/2015)

Analytical Fraction	Analytes				Failure Rate
	Scored	Within Limits	Outside 95% CI Warning Limits	Outside 99% CI Action Limits	
Trace Aqueous Volatile Organics	1739	1712	13	14	0.8%
L/M Aqueous Volatile Organics	1174	1137	22	15	1.3%
Volatile Organics in Soil	1422	1350	23	49	3.4%
Aqueous Semivolatile Organics	1373	1330	23	20	1.5%
Aqueous SIM Semivolatile Organics	317	296	16	5	1.6%
Aqueous 1,4-Dioxane Extractable	6	4	0	2	33.3%
Semivolatile Organics in Soil	1740	1634	93	13	0.7%
SIM Semivolatile Organics in Soil	221	208	12	1	0.5%
Aqueous Pesticides	186	181	5	0	0.0%
Pesticides in Soil	336	272	30	34	10.1%
Aqueous Aroclors	23	23	0	0	0.0%
Aroclors in Soil	74	72	2	0	0.0%

Table 3: Laboratory Code B SOM PES Performance Summary (09/01/2014 – 02/28/2015)

Analytical Fraction	Analytes				Failure Rate
	Scored	Within Limits	Outside 95% CI Warning Limits	Outside 99% CI Action Limits	
Trace Aqueous Volatile Organics	317	310	4	3	0.9%
L/M Aqueous Volatile Organics	131	131	0	0	0.0%
Volatile Organics in Soil	194	188	4	2	1.0%
Aqueous Semivolatile Organics	162	162	0	0	0.0%
Aqueous SIM Semivolatile Organics	45	45	0	0	0.0%
Aqueous 1,4-Dioxane Extractable	0	NA	NA	NA	NA
Semivolatile Organics in Soil	205	203	2	0	0.0%
SIM Semivolatile Organics in Soil	25	24	1	0	0.0%
Aqueous Pesticides	12	12	0	0	0.0%
Pesticides in Soil	55	43	8	4	7.3%
Aqueous Aroclors	1	1	0	0	0.0%
Aroclors in Soil	9	9	0	0	0.0%

Laboratory Code B SOM PES Performance Charts (09/01/2010 – 02/28/2015)



Laboratory Code B SOM PES Performance Charts (09/01/2014 – 02/28/2015)

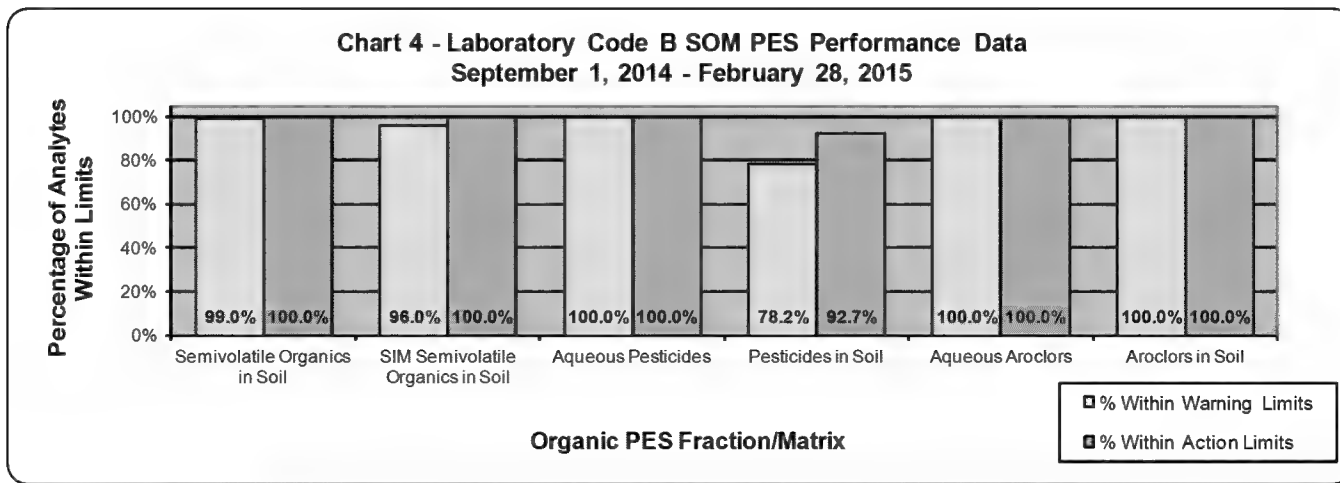
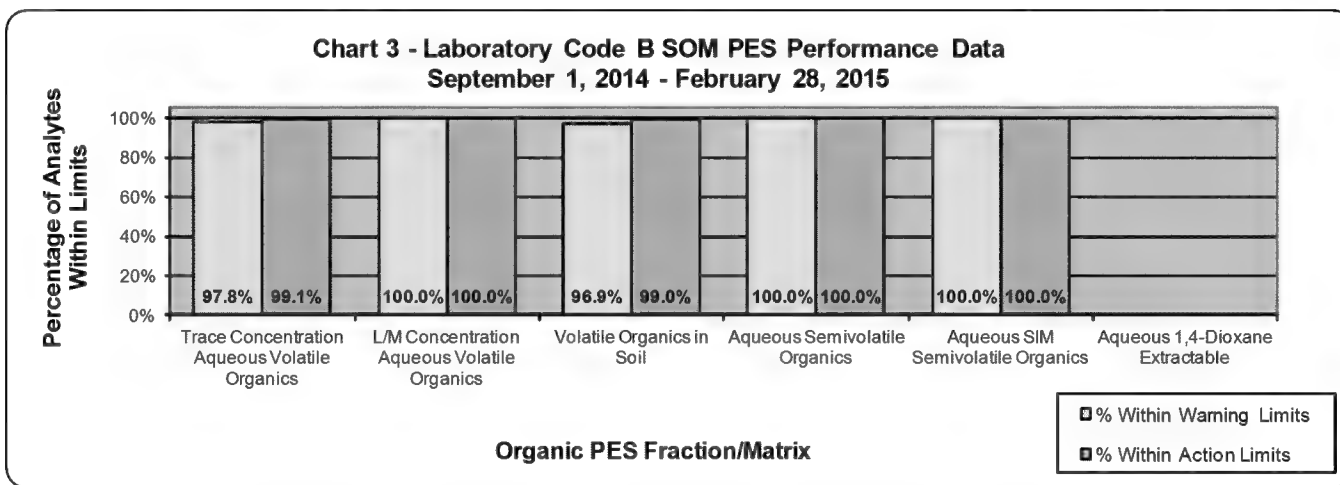


Table 4: Laboratory Code B SOM QB Performance Summary - September 1, 2010 to February 28, 2015

SOM QB Event	Overall Score %	Volatiles Score %			Senivolatiles Score %				Pesticides Score %		Aroclors Score %	
		Trace Water	SIM Water	Soil	Water	SIM Water	Soil	SIM Soil	Water	Soil	Water	Soil
QB1-FY11	97.8	100.0	100.0	100.0	100.0	100.0	100.0	100.0 ¹	100.0	77.3	100.0	100.0
QB2-FY11	86.8	86.0	100.0	97.8	97.8	71.2	100.0	75.0 ¹	100.0	100.0	100.0	100.0
QB3-FY11	99.3	100.0	100.0	100.0	100.0	100.0	100.0	100.0	75.0	100.0	100.0	100.0
QB4-FY11	95.7	100.0	100.0	100.0	100.0	91.7	100.0	50.0	100.0	100.0	100.0	100.0
QB1-FY12	99.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	87.5	100.0	100.0
QB2-FY12	99.1	100.0	100.0	100.0	93.1	100.0	100.0	100.0	100.0	100.0	100.0	100.0
QB3-FY12	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
QB4-FY12	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
QB1-FY13	97.8	100.0	100.0	100.0	97.8	100.0	100.0	100.0	100.0	100.0	100.0	100.0
QB2-FY13	97.0	100.0	NA	97.8	100.0	100.0	100.0	100.0	100.0	90.4	100.0	100.0
QB3-FY13	97.0	95.8	NA	100.0	97.8	100.0	100.0	100.0	100.0	100.0	100.0	100.0
QB4-FY13	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
QB1-FY14	97.0	100.0	NA	100.0	97.8	100.0	100.0	91.7	100.0	100.0	100.0	100.0
QB2-FY14	99.2	100.0	NA	95.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
QB3-FY14	96.9	97.8	100.0	100.0	91.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
QB4-FY14	100.0	100.0	NA	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
QB1-FY15	99.2	100.0	NA	100.0	100.0	100.0	100.0	100.0	100.0	87.5	100.0	100.0
Average	97.8	98.8	100.0	99.5	98.6	97.8	100.0	95.1	98.5	96.6	100.0	100.0
CLP Average	95.3	95.4	NA	97.0	96.4	97.4	96.6	97.0	98.2	98.3	95.1	93.8

**Chart 5 - Laboratory Code B SOM QB Performance Data
September 1, 2010 - February 28, 2015**

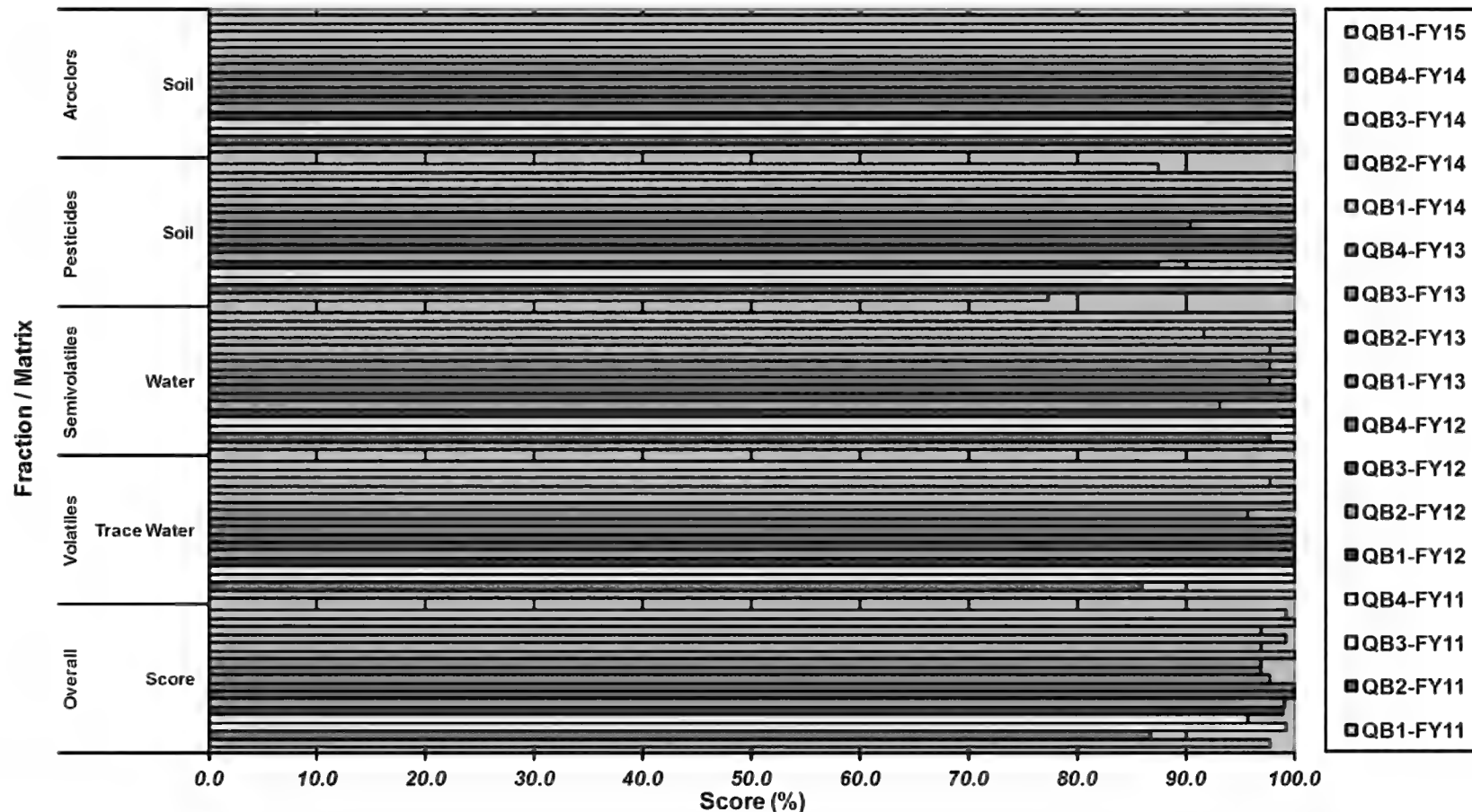


Table 5: Laboratory Code B PES Summary - September 1, 2010 to February 28, 2015

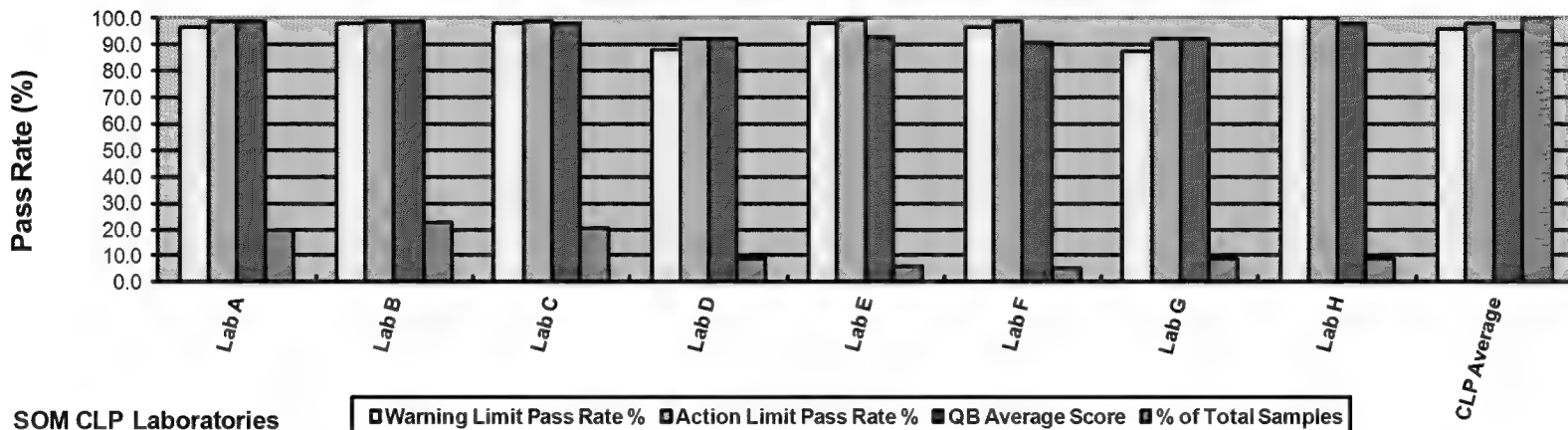
Trace Concentration Aqueous Volatile Organics PE Samples

Report Date	Requesting Region	PES #	Analytes				
			Spiked	Scored	Within Limits	Outside Warning Limits (95% CI)	Outside Action Limits (99% CI)
10/13/2010	4	PA01304	10	10	10	0	0
10/14/2010	7	VT00326	32	31	29	0	2
10/21/2010	7	VT00215	32	31	30	0	1
10/21/2010	7	VT00329	32	32	31	1	0
11/02/2010	7	VT00205	32	31	31	0	0
↓ ↓ ↓ ↓ ↓	↓ ↓ ↓ ↓ ↓	↓ ↓ ↓ ↓ ↓	↓ ↓ ↓ ↓ ↓	↓ ↓ ↓ ↓ ↓	↓ ↓ ↓ ↓ ↓	↓ ↓ ↓ ↓ ↓	↓ ↓ ↓ ↓ ↓
12/12/2014	4	VT00775	30	29	29	0	0
01/09/2015	4	VT00551	30	29	29	0	0
01/14/2015	4	VT00569	30	29	29	0	0
01/15/2015	1	VT00504	30	29	28	0	1
01/16/2015	1	VT00643	30	29	29	0	0
01/16/2015	1	VT02363	32	32	32	0	0
01/16/2015	1	VT02364	32	32	32	0	0
Total		62 PESs	1803	1739	1712	13	14

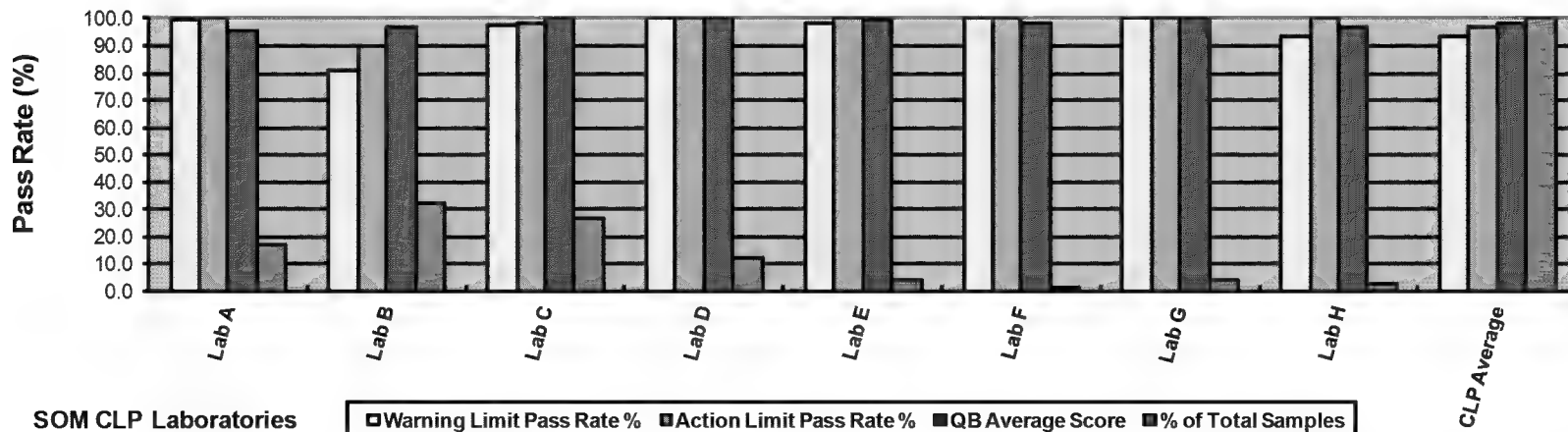
Table 8: Laboratory Code B Volatile Organics Analyte Summary
(108 Aqueous / 55 Soil PESs)

Aqueous (2913 Total Analytes Scored)			Soil (1422 Total Analytes Scored)		
Analyte	Outside Warning	Outside Action	Analyte	Outside Warning	Outside Action
Dichlorodifluoromethane	1H ^T	1H	Dichlorodifluoromethane		
Chloromethane		1H	Chloromethane		
Vinyl chloride			Vinyl chloride		
Bromomethane	1H		Bromomethane	2L	4L
Chloroethane	1L		Chloroethane		
Trichlorofluoromethane			Trichlorofluoromethane	1H	
1,1-Dichloroethene	1H ^T	1L ^T , 1L	1,1-Dichloroethene	1L	1L
1,1,2-Trichloro-1,2,2-trifluoroethane	1L	1L ^T	1,1,2-Trichloro-1,2,2-trifluoroethane		
Acetone	1H		Acetone	1L, 1H	
Carbon disulfide	1L ^T , 1H		Carbon disulfide		6L
Methyl acetate		1H ^T	Methyl acetate	1L	
Methylene chloride	1H	1L	Methylene chloride		
trans-1,2-Dichloroethene	1H		trans-1,2-Dichloroethene		

**Trace Concentration Aqueous Volatile Organics PE Samples
September 1, 2010 - February 28, 2015**



**Pesticides in Soil PE Samples
September 1, 2010 - February 28, 2015**



Average % Pass Rate for CLP SOM Routine PESs and QB PESs (09/01/2010 – 02/28/2015)

Analytical Fraction	Routine PES Average % Pass Rate (99% CI)	QB PES Average % Pass Rate (90% CI)
Trace Aqueous Volatile Organics	97.9	95.4
L/M Aqueous Volatile Organics	97.3	NA
Volatile Organics in Soil	98.2	97.0
Aqueous Semivolatile Organics	99.2	96.4
Aqueous SIM Semivolatile Organics	98.0	97.4
Aqueous 1,4-Dioxane Extractable	82.5	NA
Semivolatile Organics in Soil	95.5	96.6
SIM Semivolatile Organics in Soil	97.7	97.0
Aqueous Pesticides	98.2	98.2
Pesticides in Soil	96.5	98.3
Aqueous Aroclors	98.9	95.1
Aroclors in Soil	99.4	93.8

Average % Pass Rate for CLP ISM Routine PESs and QB PESs (09/01/2010 – 02/28/2015)

Analytical Fraction	Routine PES Average % Pass Rate (99% CI)	QB PES Average % Pass Rate (90% CI)
Aqueous Metals ICP-MS	96.1	96.8
Aqueous Metals ICP-AES	92.7	98.1
Metals in Soil ICP-MS	98.3	98.2
Metals in Soil ICP-AES	96.3	98.1
Aqueous Mercury	95.7	97.6
Aqueous Cyanide	96.3	94.0
Cyanide in Soil	94.5	98.8
Lead Wipes	97.4	NA

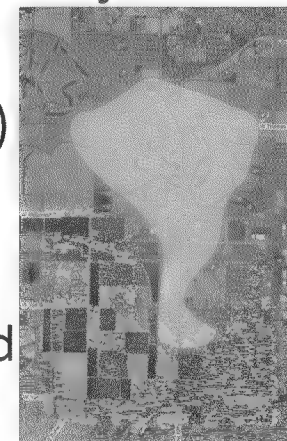
Trending SOM PES Analyte Results by Laboratory

Laboratory	Analyte	Failure Rate
Laboratory A	Bromodichloromethane (Trace VOC)	17.4%
	Naphthalene (Aqueous SIM SVOC)	42.9%
Laboratory B	Carbon disulfide (VOC Soil)	28.6%
	Dibromochloromethane (VOC Soil)	26.9%
	Styrene (VOC Soil)	30.4%
	1,4-Dioxane	33.3%
	Heptachlor (Pesticides Soil)	30.0%
Laboratory C	DBCP (Aqueous L/M VOC)	22.9%
	1,4-Dioxane	33.3%
Laboratory D	Methylcyclohexane (Trace VOC)	23.1%
	Cyclohexane (VOC Soil)	42.9%
Laboratory E	None Observed	NA
Laboratory F	None Observed	NA
Laboratory G	EDB (Trace VOC)	20.0%
	Freon 113 (Trace VOC)	22.9%
Laboratory H	None Observed	NA

Trending ISM PES Analyte Results by Laboratory		
Laboratory	Analyte	Failure Rate
Laboratory A	Antimony (ICP-MS)	27.3%
	Cobalt (ICP-AES)	18.2%
Laboratory B	Manganese (ICP-MS)	16.7%
	Chromium (ICP-AES)	20.5%
	Aqueous Mercury	10.2%
	Cyanide Soil	13.6%
Laboratory C	Zinc (ICP-MS)	19.0%
	Ca, Pb, Fe (ICP-AES Recent Period)	25.0%
Laboratory D	None Observed	NA
Laboratory E	None Observed	NA

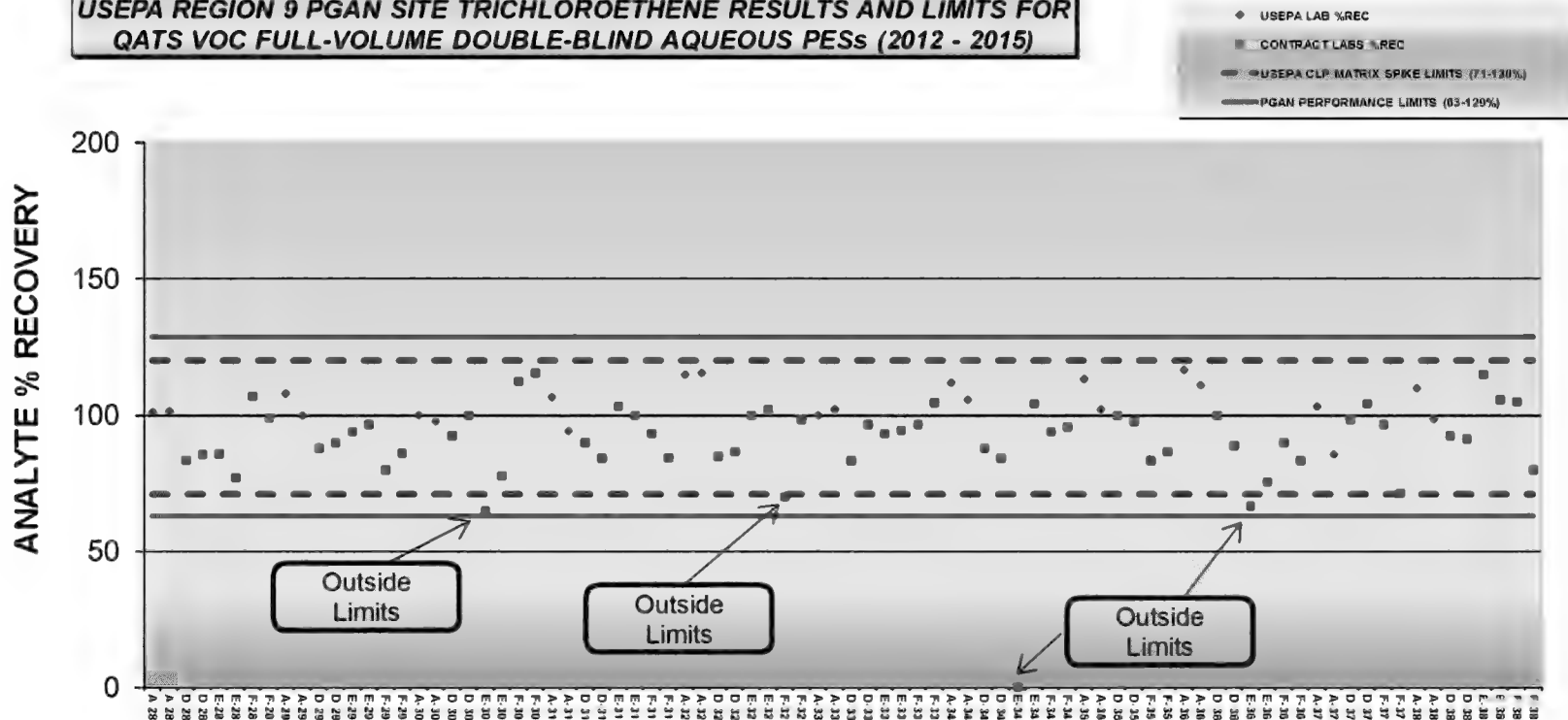
Long-Term Region 9 PGAN Site Quarterly Monitoring Project

- Superfund site contaminated with trichloroethene (TCE) and perchlorate (ClO_4^-).
- QATS Program has supplied full-volume double-blind samples for 38 sampling events over 10 years – high and low concentration TCE and ClO_4^- PESs for each event.
- PESs range from 2 to 300 ppb TCE, and 1 to 200 ppb ClO_4^- .
- Six labs have analyzed samples over 10 years, the same 4 labs over the last 4 years.
- Regional personnel coordinate with the sampling contractor and QATS Laboratory – samplers ship containers to QATS, and samples are prepared and shipped back to the samplers to integrate the PESs with field samples using mock well numbers.



- Results for each event are compiled and evaluated by QATS, and scoring summary reports and trending charts are provided to the Region.
- Feedback indicates that Regional personnel and the RPM find the summary reports and results trending very useful.
- One of the 4 contract labs has submitted anomalous results for both TCE and ClO_4^- periodically over the last 4 years.
- RPM has used the PES results and trending to exclude this lab from analyzing field samples for several quarterly events.
- QATS Program provides similar PES performance monitoring for the sister PGAS site using TCE and chromium full-volume double-blind PESs.

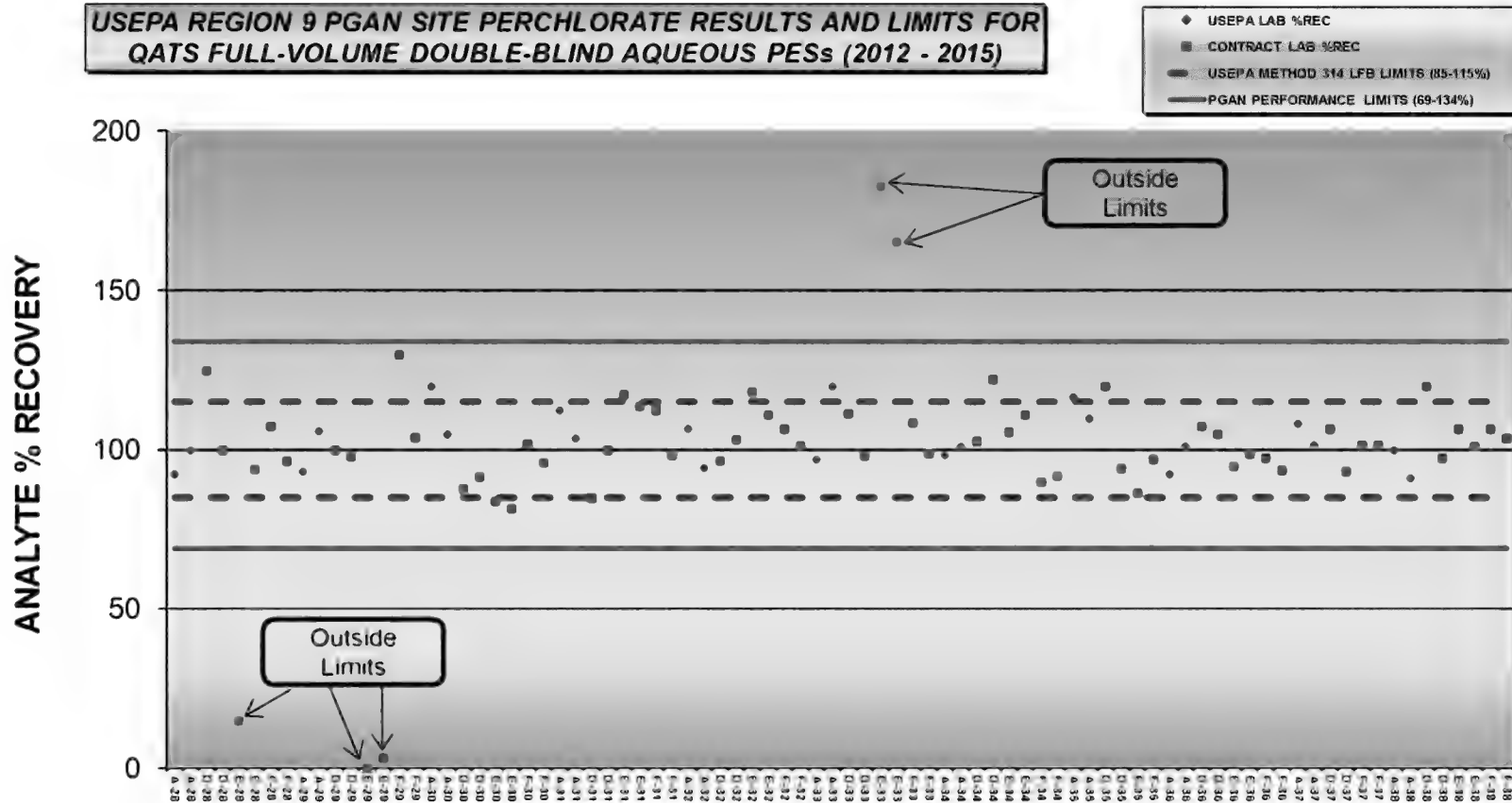
USEPA REGION 9 PGAN SITE TRICHLOROETHENE RESULTS AND LIMITS FOR QATS VOC FULL-VOLUME DOUBLE-BLIND AQUEOUS PESs (2012 - 2015)



PGAN OVERALL SUMMARY

6 Labs n=223 Ave % Rec=96% RSD=13% Spike Range 3-300 ppb

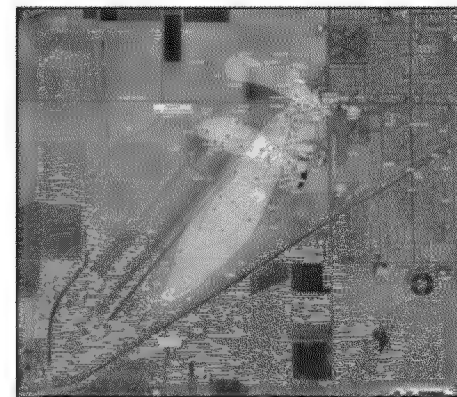
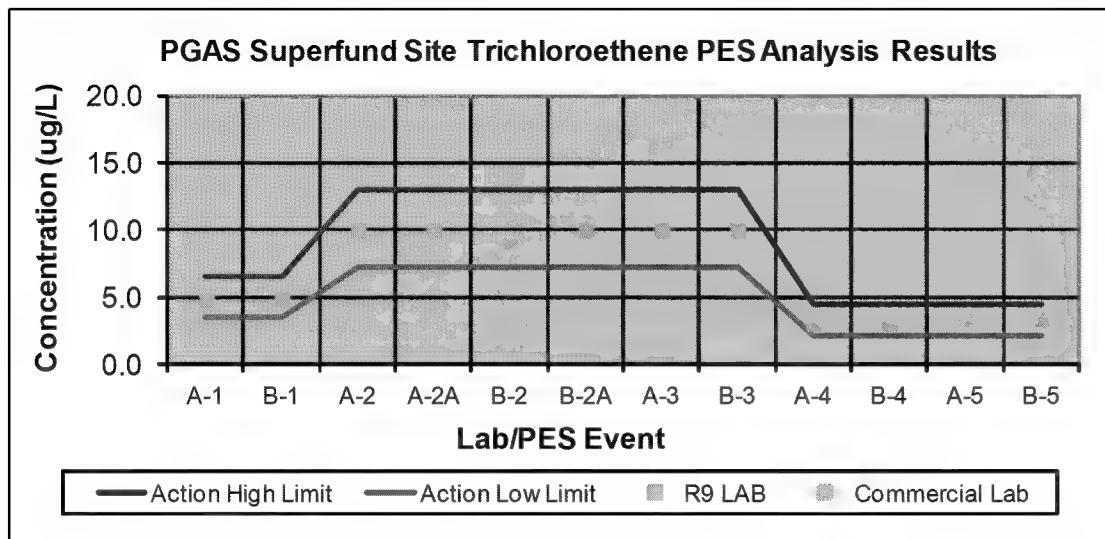
USEPA REGION 9 PGAN SITE PERCHLORATE RESULTS AND LIMITS FOR QATS FULL-VOLUME DOUBLE-BLIND AQUEOUS PESs (2012 - 2015)



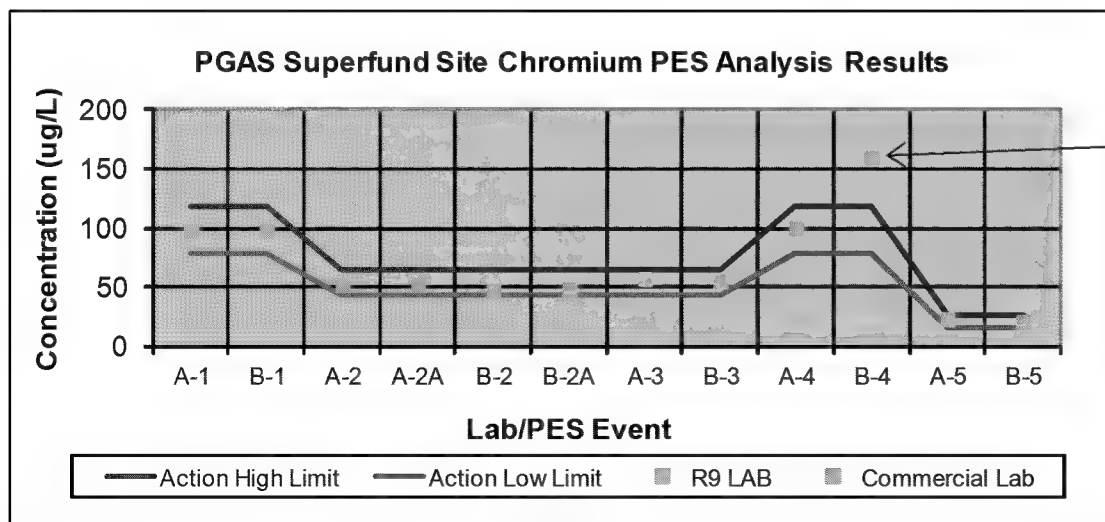
PGAN OVERALL SUMMARY				
6 Labs	n=217	Ave % Rec=101%	RSD=12%	Spike Range 1-600 ppb

PGAN Site - Analyte & Laboratory Performance Data

	Regional Lab		Contract Labs		Composite	
	TCE	ClO ₄	TCE	ClO ₄	TCE	ClO ₄
Avg. % Rec.	103	103	92	100	96	101
RSD	11.7	10.3	11.9	12.4	12.9	11.8
n	76	76	147	141	223	217



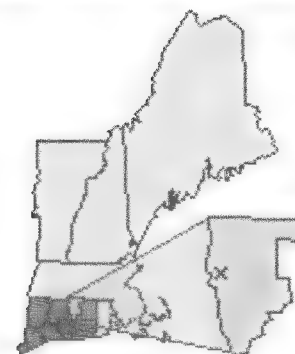
Region 9 PGAS Site



Outside Limits



Region 1 Walton & Lonsbury Site

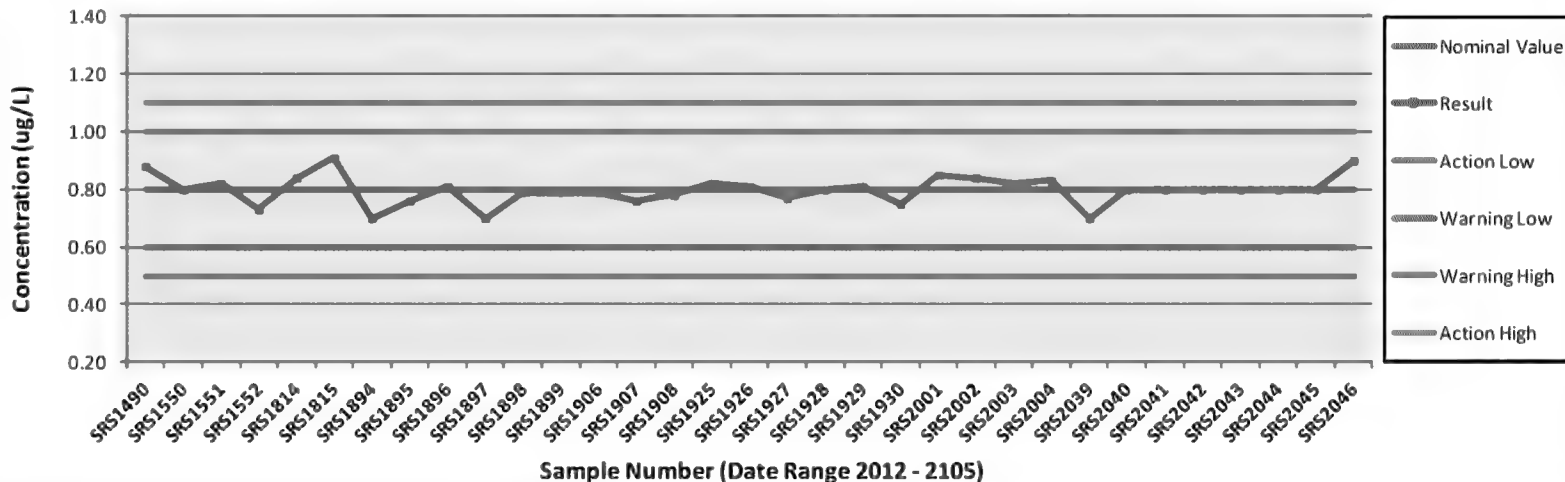


Region 1 Precision Plating Site

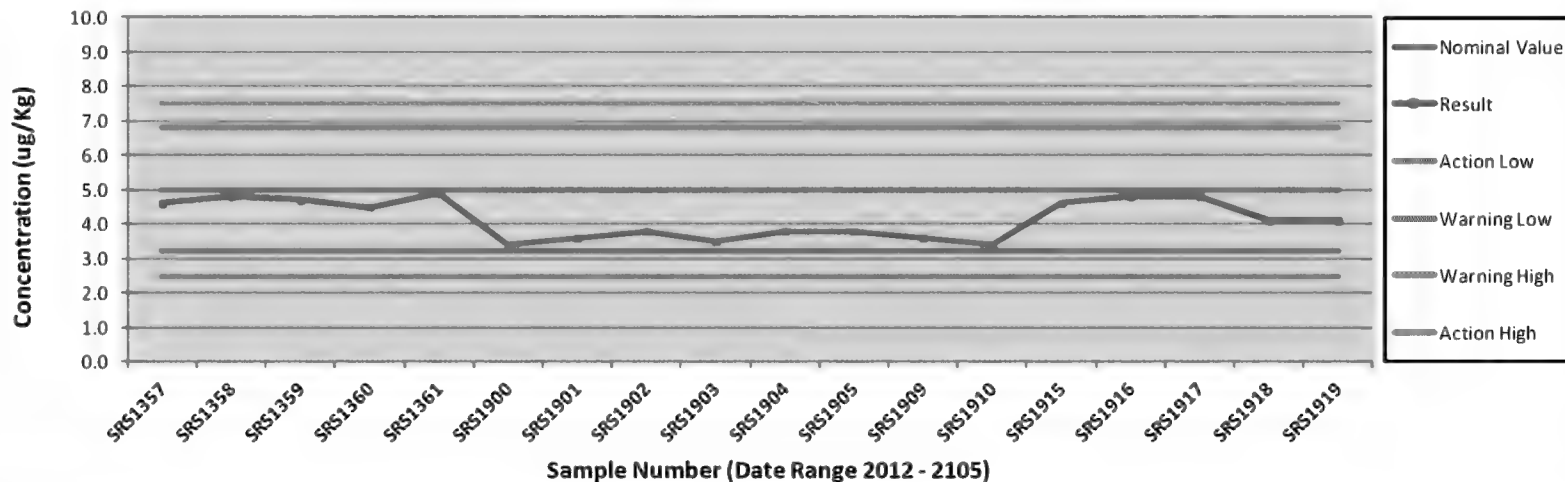
Hexavalent Chromium Samples for EPA Region 1

- QATS provides both aqueous and soil hexavalent chromium PESs for two Region 1 Superfund sites.
- Both PES matrices are typically low-level:
 - ✓ Aqueous PESs at 0.8 ug/L
 - ✓ Soils at 5 mg/Kg
- Results have been monitored over a two-year period.
- Analytical results for both matrices are consistently within the established acceptance limits.

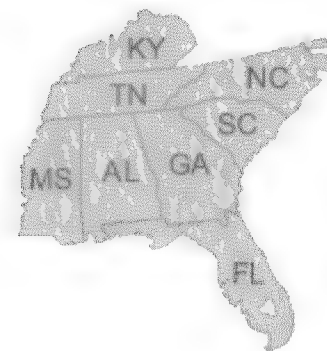
Aqueous Hexavalent Chromium PES Results
Region 1 - Precision Plating and Walton & Lonsbury Sites (2012 - 2015)



Hexavalent Chromium in Soil PES Results
Region 1 - Precision Plating and Walton & Lonsbury Sites (2012 - 2015)



Region 4 Dioxin/Furan PES Issue



USEPA Region 4

- In December 2014, Region 4 asked QATS to review the performance of a DLM lab on a PES analysis from October 2014 with anomalous results, from the same PES Lot Number that the lab analyzed in February 2014 with all passing results.
- The Region was concerned that the PES may have been mislabeled, or there was some other issue with the PES.
- QATS determined that Region 4 ordered only Sigma 407 and 408 over the past 3 years.
- Using information from the CDD/CDF PES inventory recipes and historical analytical statistics, QATS determined that both the February and October 2014 PESs were indeed Sigma 408.

Region 4 Dioxin/Furan PES Issue

- We provided our conclusions and logic to Region 4 that we believed that the lab performed poorly in the processing and analysis of the October 2014 PES.
- In February 2015, Region 4 sent another scoring report for a separate PES analysis of a different PES that exhibited anomalous results.
- Region 4 documentation indicated that this PES was Sigma 407, and QATS verified the identity of this PES using the same procedure as Sigma 408. We also verified that there were no integrity issues with either PES based on the analytical trending results and other information.
- On both Sigma 407 and 408, the lab's TCDD and TCDF results were both within limits; however, the penta analytes were recovered at 65% of nominal values, and the hexa analytes and above were recovered at 35% of the nominal values.

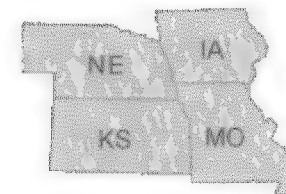
Region 4 Dioxin/Furan PES Issue

- We again recommended that Region 4 look at the raw data and QA results to determine what might have led to the failing PES results.
- Region 4 instructed the lab to re-extract and re-analyze Sigma 407 from the remaining sample, and in March 2015, Region 4 submitted these results to QATS to evaluate and score.
- The results from the reprocessed sample for all spiked congeners and total homologues were within the acceptance limits.
- The DLM SOW Form 1 does not provide for listing the soil extraction method because only Soxhlet/Dean Stark extraction using toluene is allowed for soils/sediments; therefore, the soil extraction method is not listed on the SPSWeb scoring report either.
- In reviewing the extraction logs for all samples, Region 4 observed that the extraction type was listed as “other” for the PESs with failing results.

Region 4 Dioxin/Furan PES Issue

- A follow-up investigation by Region 4 resulted in the these determinations by the laboratory:
 - ✓ Pressurized Fluid Extraction (PFE), a non-compendial extraction method, was used to extract the PESs with failing results.
 - ✓ PFE was being investigated by the laboratory as an alternative extraction method, and it was inadvertently used as the extraction method for this case, including the PESs.
 - ✓ Use of this extraction method was not discovered during the lab's internal QA review of the data package.
 - ✓ The lab is also investigating alternate extraction solvents.
- Summary:
 - ✓ Use of PESs for this case resulted in the discovery of a laboratory performance issue.
 - ✓ The laboratory should have discovered this non-conformity during internal data review or early in the investigation.
 - ✓ The persistence of Region 4 personnel resulted in the successful conclusion to this investigation.

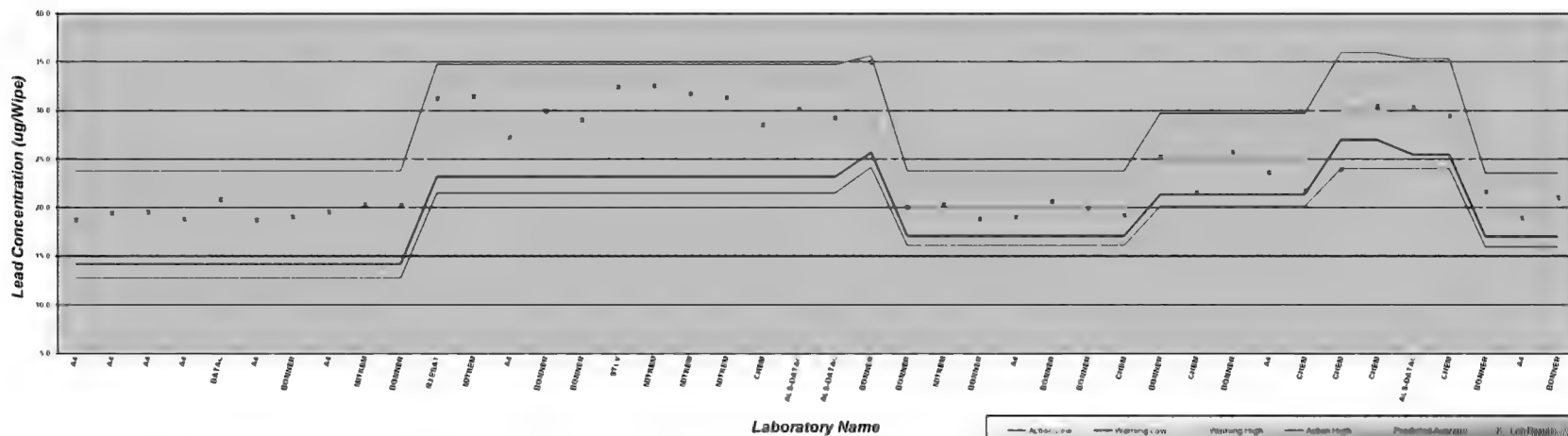
Lead Wipe Samples for Region 7



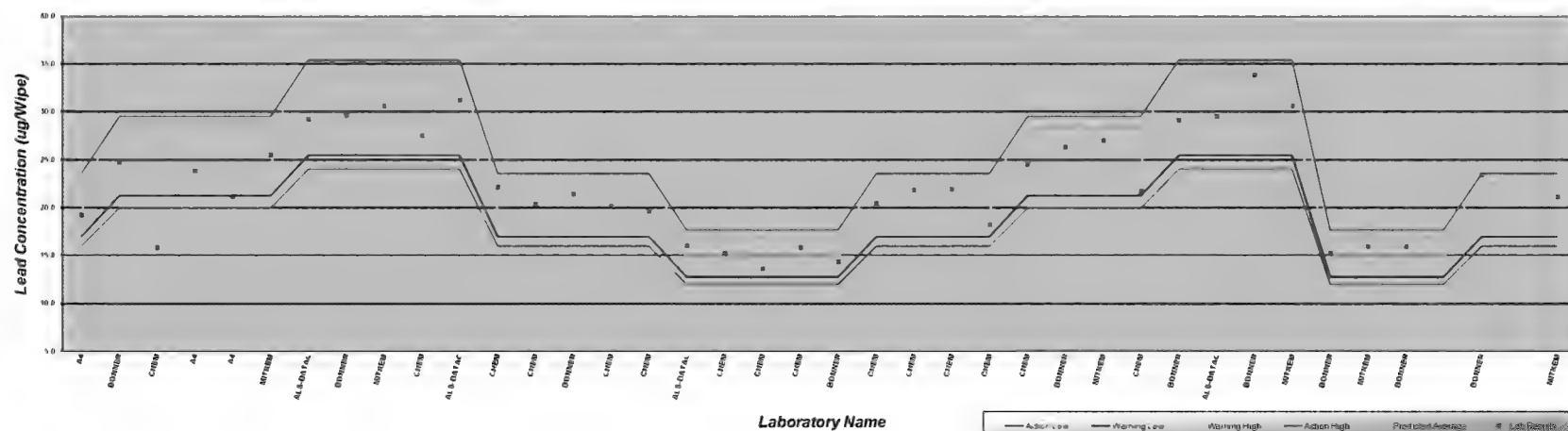
USEPA Region 7

- QATS has provided lead wipe samples to EPA Region 7 for various Superfund sites on a routine basis since January 2011.
- Nominal concentrations vary from 15 to 35 ug/wipe.
- Calculated acceptance limits are relatively narrow.
- Only 1 analytical result has exceeded the action limits.
- Analytical results indicate that these samples are prepared accurately and analyzed with a high degree of precision.

Lead Wipe PES Results - Region 7 Cases (January 2012 - October 2013)



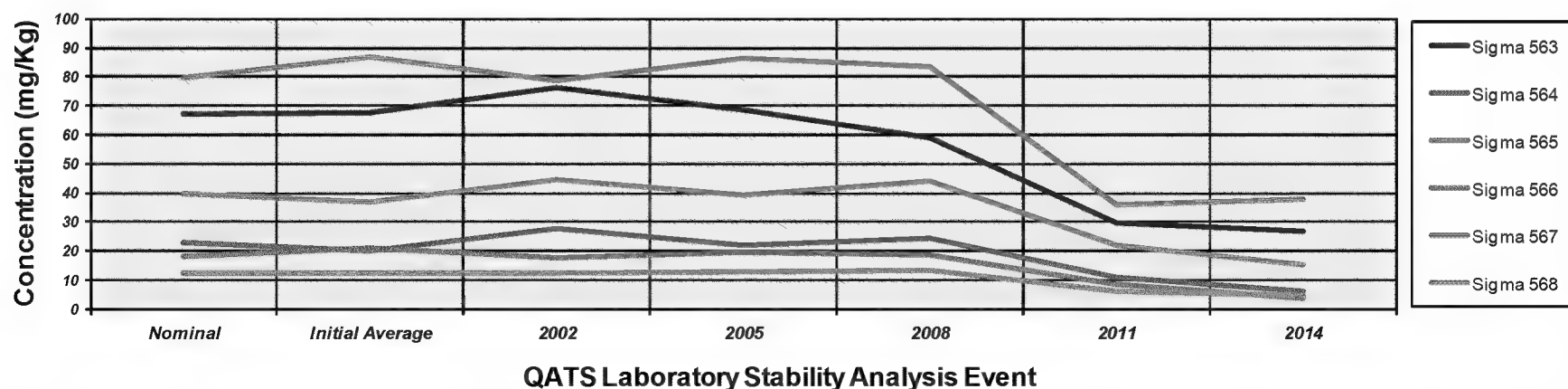
Lead Wipe PES Results - Region 7 Cases (November 2013 - March 2015)



What's up with Antimony in Soil Samples?

- Over the last four (4) years, QATS has detected a downward trend for the antimony results in the metals in soil PESs compared to the nominal concentrations and previous stability results.
- The chart below illustrates the decrease in antimony results in the Catalog Number 95-017-S metals in soil PESs since the 2011 PES stability analysis cycle.

Catalog Number 95-017-S Metals in Soil PESs - Antimony Historic Stability Results



What's up with Antimony in Soil Samples?

- We believe that the downward trend for antimony results is due to the rigorous soil digestion procedures implemented in the CLP ISM SOW.
- The longer heating cycles and changes in acid used in the CLP ISM SOW soil digestion procedure may lead to the formation of relatively insoluble antimony oxides, Sb_2O_3 and Sb_2O_5 .
- The table below presents recent analyses of a PES using the ILM, ISM, and modified ISM digestion procedures.

Sigma #570 Results Using Various Extraction Procedures – Antimony Nominal: 52 mg/Kg					
Digestion Method	Replicate #1 (mg/Kg)	Replicate #2 (mg/Kg)	Replicate #3 (mg/Kg)	Average	Average % Recovery
ILM	50.2	43.9	48.8	47.6	92%
ISM	33.3	28.7	31.8	31.3	60%
ISM Modified	34.9	38.4	40.8	38.0	73%

What's up with Antimony in Soil Samples?

- SPSWeb acceptance limits are updated on a periodic basis as additional data are collected from the use of PESs.
- Further investigation and analysis may be required.
- QATS is evaluating the antimony results from all sources, for all metals in soil PESs, in order to determine if the PES results accumulated prior to the use of the CLP ISM SOW should be excluded from the database used to establish the SPSWeb acceptance limits for antimony in metals in soil PESs.

Changes Coming to SPSWeb to Accommodate the New SOM and ISM SOWs

SPSWeb

Superfund PES Scoring - Web

➤ ISM SOW

- ✓ Scoring method option for ISM02.2 will be added to the “Method Drop-Down List”.
- ✓ List of allowable qualifiers for “Q” column will be modified to include X, *, D, J, and U qualifier.
- ✓ The “C” and “M” columns will be removed from the following pages:
 - Edit Analytes
 - Confirm Analytes
 - View Score
 - Add Analytes
 - PES Scoring Evaluation Reports (both EPA and Lab versions)

- ✓ Since the “U” qualifier will be placed in the “Q” column, the scoring logic corresponding to the “U” qualifier will be modified.
- ✓ New drop-down list for “Analytical Method” on the “Edit Headers” page to include:
 - ICP-AES Metals
 - ICP-MS Metals
 - CVAA Mercury
 - Spectrophotometry Cyanide
- ✓ Other changes will be made to data entry pages and the PES Scoring Evaluation Report headers to coincide with the ISM02 Form I.

➤ SOM SOW

✓ Program logic and header fields will be modified to accommodate new Form I for all fractions and will include the following pages:

- Edit Headers
- Display Headers
- View Score
- PES Scoring Evaluation Reports (both EPA and Lab versions)

✓ New drop-down list for “Analytical Method” on the “Edit Headers” page to include:

- Trace VOC
- VOC
- SVOC
- SIM SVOC
- PEST
- ARO
- Other

➤ SOM SOW

✓ Drop-down list for “Extraction Type” will be modified to include:

- SEPF
- CLLE
- CONH
- SONC
- SOXH
- PFEX
- Other

✓ A drop-down list to select multiple clean-up methods to include:

- GPC
- Florisil
- Acid
- Sulfur
- Other

➤ SOM SOW

- ✓ List of allowable qualifiers will have no set maximum, and will be modified to include U, J, B, E, D, C, A, N, P, S, H, X, Y, and Z.
- ✓ 1,4-Dioxane will be added to the SVOC TCL, and 3-methylphenol will be added to the SVOC TCL for TCLP.
- ✓ CRQLs will be changes for the SVOC fraction, as needed.
- ✓ The names for alpha-chlordane and gamma-chlordane will be changed to cis-chlordane and trans-chlordane, respectively.

PES Use in the Contract Laboratory Program



- PESs are typically analyzed along with field samples as requested by the EPA Regions, and are used to monitor and document the performance of laboratories and analytical methods.
- PESs are also used to evaluate the performance of all CLP labs on a quarterly basis (QB Program), and are used in the contract solicitation process (Pre-award).
- PES results are used to assist in the validation and verification of field sample analysis results, and enhance the confidence in the quality of data and the decision-making process.

QATS Standard PES Inventory

- Single-blind quality control samples:
 - ✓ Sample is recognizable as a PES
 - ✓ Analytes and concentrations in PES are unknown to the laboratories
- Analytes and concentrations are typically in accordance with the CLP SOWs.
- Aqueous samples are concentrates for dilution, and soils are full-volume samples.
- PESs are shipped with chain-of-custody records and PES preparation and analytical instructions.
- PES results are usually scored using the QATS web-based PES scoring application SPSWeb.



QATS Standard PES Analytical Fractions

➤ Organics include:

- ✓ Trace and low/medium concentration volatile organics waters
- ✓ Low/medium concentration semivolatile organics, pesticides, and Aroclor waters
- ✓ SIM semivolatile organics waters and soils (PAHs & pentachlorophenol)
- ✓ 1,4-Dioxane purgeable and extractable waters
- ✓ Dioxin/furan waters for HRGC/HRMS analysis
- ✓ Low/medium and medium concentration volatile organics in soil
- ✓ Low/medium concentration semivolatile organics, pesticides, and Aroclors in soil
- ✓ Dioxins/furans in soil for HRGC/LRMS and HRGC/HRMS analysis
- ✓ CB congeners in water or soil for HRGC/HRMS analysis

➤ Inorganics include:

- ✓ Waters and soils for metals analysis by ICP-AES and ICP-MS
- ✓ Waters and soils for mercury analysis
- ✓ Waters and soils for cyanide analysis
- ✓ Lead wipe samples

QATS Special-Request & Site-Specific PESs

- PESs not in the standard QATS PES Superfund inventory or in the Superfund PES Catalog.
- PESs that can be made at the QATS Laboratory on special-request through ASB, Regional CLP PO, or authorized PES requestors.
- PESs that can be purchased from commercial PES vendors through the QATS Program.
- CLP target compounds are needed at defined concentrations and/or in specific combinations.
- Site-specific target compounds or site-specific matrices are needed.
- Full-volume and/or double-blind PESs are required.
- Validation of specific detection limits, laboratory comparisons or evaluations, or verification of project-specific analytical precision and accuracy might be needed.

Ordering Performance Evaluation Samples

- Authorized requestors can order PESs and RMs.
- CLP and Regional labs can order RMs.
- Electronic version of the 2015 Superfund PES Catalog, distributed in January 2015, is available on SPSWeb or from QATS personnel.
- PES and RM Order Forms are located on SPSWeb and in the back of the PES Catalog.
- PES and RM orders are placed by sending a completed PES or RM Order Form to QATS using the contact information on the form:
 - ✓ E-mail orders to QATSPESORDER@CBIFEDERALSERVICES.com
 - ✓ Fax orders to (702) 795-8210

Contacts for PESs Provided by QATS

Regional CLP Project Officer
Regional Authorized PES Requestor

ASB Contacts:

Shari Myer

E-mail: myer.shari@epa.gov

Phone: (703) 603-8848

QATS Contacts:

Keith Strout

E-mail: keith.strout@cbifederaleservices.com

Phone: (702) 895-8722

Clyde Hedin

E-mail: clyde.hedin@cbifederaleservices.com

Phone: (702) 895-8711